AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions of claims in the application.

1 (Currently Amended): A circuit pattern inspection apparatus for inspecting a plurality of target patterns having first and second opposite ends included in an inspection region thereof and ~~arrange~~ arranged in lines, which is adapted to supply an AC inspection signal from the first end side of said inspection region of said target patterns, and detect a signal from the second end side of said inspection region, said circuit pattern inspection apparatus comprising:

supply means including a supply electrode for supplying said inspection signal from the first end side of said inspection region of said target patterns;

detection means including a sensor electrode for detecting a signal from each of said target patterns; and

moving means for moving said supply and sensor electrodes, respectively, with a given gap relative to each of said target patterns, across said first and second ends included in said inspection region and ~~arrange~~ arranged in lines~~, with a given gap relative to each of said target patterns~~.

2 (Original): The circuit pattern inspection apparatus as defined in claim 1, wherein each of said target patterns is a conductive pattern formed on a circuit board, said conductive pattern having a bar-like shape with a given width.

3 (Original): The circuit pattern inspection apparatus as defined in claim 1 or 2, wherein said sensor electrode has a width equal to or greater than a width of two lines of said target patterns.

4 (Original): The circuit pattern inspection apparatus as defined in claim 1 or 2, wherein said sensor electrode includes:

a first sensor electrode adapted to be disposed at a position opposed to the second end of one of the adjacent target patterns which has the first end supplied with the inspection signal from said supply electrode; and

a second sensor electrode adapted to be disposed at a position opposed to the second end of a remaining one of said adjacent target patterns.

5 (Original): The circuit pattern inspection apparatus as defined in claim 4, wherein said first sensor electrode has a width equal to or less than each width of said target patterns.

6 (Previously Presented): The circuit pattern inspection apparatus as defined in claim 4, wherein said second sensor electrode has a width equal to or less than each width of said target patterns.

7 (Previously Presented): The circuit pattern inspection apparatus as defined in claim 1 or 2, wherein said moving means is adapted to move said supply and sensor electrodes, respectively, across said first and second ends included in said inspection region and arrange in lines, under the condition that each surface of said supply and sensor electrodes is capacitively coupled with each of said target patterns.

8 (Previously Presented): The circuit pattern inspection apparatus as defined in claim 1 or 2, which further includes determination means operable, when a detection result of said detection means based on a detection signal from one of said target patters is in a given acceptable range, to determine that said target pattern is normal, and, when a detection result of

said detection means based on a detection signal from one of said target patters is out of said given acceptable range, to determine that said target pattern is defective.

9 (Original): The circuit pattern inspection apparatus as defined in claim 8, which includes:

second moving means for moving said supply and sensor electrodes to respective positions opposed to the first and second ends of said defective target pattern determined by said determination means, and moving either one of said supply and sensor electrodes along said defective target pattern toward the other electrode; and

position detection means for detecting a position where a detection signal from said defective target pattern has a change, in accordance with a detection result of said detection means.

10 (Original): The circuit pattern inspection apparatus as defined in claim 9, which includes contacting means for bringing either one of said supply and sensor electrodes into contact with said defective target pattern.

11 (Previously Presented): The circuit pattern inspection apparatus as defined in claim 9, wherein at least one of said supply and sensor electrodes which is to be moved by said second moving means includes an image pickup means.

12 (Previously Presented): The circuit pattern inspection apparatus as defined in claim 9, which includes a gap control means for positioning at least one of said supply and sensor electrodes which is to be moved by said second movement means, in such a manner as to allow a gap between said at least one electrode and said defective target pattern to be maintained at an approximately constant value.

13 (Previously Presented): The circuit pattern inspection apparatus as defined in claim 1 or 2, which includes a gap control means for positioning at least one of said supply and sensor electrodes to be moved by said movement means, in such a manner as to allow a gap between said at least one electrode and each of said target patterns to be maintained at a constant value.

14 (Currently Amended): The circuit pattern inspection apparatus as defined in claim 12, wherein said gap control means includes a displacement measurement device disposed at a position adjacent to said sensor or supply electrode and adapted to be moved together with said sensor or supply electrode, said gap control means being operable to position said sensor or supply electrode in a direction orthogonal to said inspection region in accordance with a detection result of said displacement measurement device, in such a manner as to allow a gap between said sensor or supply electrode and said inspection region to be maintained at an approximately constant value.

15 (Currently Amended): ~~The circuit pattern inspection apparatus as defined in claim 14,~~ A circuit pattern inspection apparatus for inspecting a plurality of target patterns having first and second opposite ends included in an inspection region thereof and arranged in lines, which is adapted to supply an AC inspection signal from the first end side of said inspection region of said target patterns, and detect a signal from the second end side of said inspection region, said circuit pattern inspection apparatus comprising:

supply means including a supply electrode for supplying said inspection signal from the first end side of said inspection region of said target patterns;

detection means including a sensor electrode for detecting a signal from each of said target patterns; and

moving means for moving said supply and sensor electrodes, respectively, across said first and second ends included in said inspection region and arranged in lines, with a given gap relative to each of said target patterns;

further including a determination means operable, when a detection result of said detection means based on a detection signal from one of said target patters is in a given acceptable range, to determine that said target pattern is normal, and, when a detection result of said detection means based on a detection signal from one of said target patters is out of said given acceptable range, to determine that said target pattern is defective;

wherein said circuit pattern inspection apparatus includes:

second moving means for moving said supply and sensor electrodes to respective positions opposed to the first and second ends of said defective target pattern determined by said determination means, and moving either one of said supply and sensor electrodes along said defective target pattern toward the other electrode; and

position detection means for detecting a position where a detection signal from said defective target pattern has a change, in accordance with a detection result of said detection means;

wherein said circuit pattern inspection apparatus includes a gap control means for positioning at least one of said supply and sensor electrodes which is to be moved by said second movement means, in such a manner as to allow a gap between said at least one electrode and said defective target pattern to be maintained at an approximately constant value;

wherein said gap control means includes a displacement measurement device disposed at a position adjacent to said sensor or supply electrode and adapted to be moved together with said sensor or supply electrode, said gap control means being operable to position said sensor or supply electrode in a direction orthogonal to said inspection region in accordance with a detection result of said displacement measurement device, in such a manner as to allow a gap

between said sensor or supply electrode and said inspection region to be maintained at an approximately constant value;

wherein said gap control means is operable to position said sensor or supply electrode in a direction orthogonal to said inspection region, on the basis of a gap between said sensor or supply electrode and said inspection region which is defined by an average displacement of a detection result of said displacement measurement device obtained from a plurality of pitches of said target patterns. wherein said gap control means is operable to position said sensor or supply electrode in a direction orthogonal to said inspection region, on the basis of a gap between said sensor or supply electrode and said inspection region which is defined by an average displacement of a detection result of said displacement measurement device obtained from a plurality of pitches of said target patterns.

16 (Original): A circuit pattern inspection method for use in a circuit pattern inspection apparatus which comprises supply means including a supply electrode for supplying an inspection signal to each of a plurality of target patterns having first and second opposite ends included in an inspection region thereof and arrange in lines, from the first end side of said inspection region, and detection means including a sensor electrode for detecting a signal from each of said target patterns, said circuit pattern inspection method comprising:

moving said supply and sensor electrodes relative to said target patterns, respectively, across said first and second ends included in said inspection region and arrange in lines, under the condition that each surface of said supply and sensor electrodes is spaced apart from each surface of said target patterns;

supplying an AC inspection signal from the first end side of said inspection region of said target patterns; and

detecting a signal from each of said target patterns to inspect said target patterns.

17 (Original): The circuit pattern inspection method as defined in claim 16, wherein each of said target patterns is a conductive pattern formed on a circuit board, said conductive pattern having a bar-like shape with a given width.

18 (Original): The circuit pattern inspection method as defined in claim 17, which includes:

allowing said sensor electrode to have a width equal to or greater than a width of two lines of said target patterns; and

detecting a signal from one of the adjacent target patterns a remaining one of which is supplied with the inspection signal, so as to allow the presence of short circuit between said adjacent target patterns to be determined.

19 (Original): The circuit pattern inspection method as defined in claim 16 or 17, which includes:

detecting a signal from one of the adjacent target patterns which is supplied with the inspection signal, through a first sensor electrode included in said sensor electrode so as to allow the presence of disconnection in said target pattern to be determined; and

detecting a signal from a remaining one of said adjacent target patterns through a second sensor electrode included in said sensor electrode so as to allow the presence of short circuit between said adjacent target patterns to be determined.

20 (Previously Presented): The circuit pattern inspection method as defined in either one of claims 16 to 18, which includes determining a general position of a disconnected region in the target pattern in accordance with a position of said sensor electrode where said detection means has no detection signal.

21 (Previously Presented): The circuit pattern inspection method as defined in either one of claims 16 to 18, which includes evaluating whether a detection result of said detection means based on a detection signal from one of said target patters is in a given acceptable range, wherein when said detection result is in a given acceptable range, determining that said target pattern is normal, and, when said detection result is out of said given acceptable range, determining that said target pattern is defective.

22 (Original): The circuit pattern inspection method as defined in claim 21, which includes:

specifying a position of said defective target pattern determined by said determination means, and storing information about said position;

moving said supply and sensor electrodes to respective positions opposed to the first and second ends of said defective target pattern in accordance with said stored information;

moving either one of said supply and sensor electrodes along said defective target pattern toward the other electrode; and

detecting a position where a detection signal from said defective target pattern has a change, in accordance with a detection result of said detection means, and defining said position as a defective position.

23 (Original): The circuit pattern inspection method as defined in claim 22, which includes bringing either one of said supply and sensor electrodes into contact with said defective target pattern.

24 (Previously Presented): The circuit pattern inspection method as defined in claim 22, which includes:

providing image pickup means in either one of said supply and sensor electrodes; and

moving said image pickup means together with said at least one electrode along said defective target pattern toward the other electrode.

25 (Previously Presented): The circuit pattern inspection method as defined in either one of claims 16 to 18, which includes;

providing a displacement measurement device disposed at a position adjacent to said sensor or supply electrode and adapted to be moved together with said sensor or supply electrode; and

positioning said sensor or supply electrode in a direction orthogonal to said inspection region in accordance with a detection result of said displacement measurement device, in such a manner as to allow a gap between said sensor or supply electrode and said inspection region to be maintained at an approximately constant value, so as to provide a stable detection result of said detection means.

26 (Currently Amended): ~~The circuit pattern inspection method as defined in claim 25,~~ A circuit pattern inspection method for use in a circuit pattern inspection apparatus which comprises supply means including a supply electrode for supplying an inspection signal to each of a plurality of target patterns having first and second opposite ends included in an inspection region thereof and arranged in lines, from the first end side of said inspection region, and detection means including a sensor electrode for detecting a signal from each of said target patterns, said circuit pattern inspection method comprising:

moving said supply and sensor electrodes relative to said target patterns, respectively, across said first and second ends included in said inspection region and arranged in lines, under the condition that each surface of said supply and sensor electrodes is spaced apart from each surface of said target patterns;

supplying an AC inspection signal from the first end side of said inspection region of said target patterns; and

detecting a signal from each of said target patterns to inspect said target patterns;

wherein said circuit pattern inspection method includes;

providing a displacement measurement device disposed at a position adjacent to said sensor or supply electrode and adapted to be moved together with said sensor or supply electrode; and

positioning said sensor or supply electrode in a direction orthogonal to said inspection region in accordance with a detection result of said displacement measurement device, in such a manner as to allow a gap between said sensor or supply electrode and said inspection region to be maintained at an approximately constant value, so as to provide a stable detection result of said detection means;

which includes positioning said sensor or supply electrode on the basis of a gap between said sensor or supply electrode and said inspection region which is defined by an average displacement of a detection result of said displacement measurement device obtained from a plurality of pitches of said target patterns.